Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A synchronous electrical machine comprising:

- a stator (10); and
- at least one rotor (20) having permanent magnets (21),

characterized in that it is designed so as to have $X_d > X_q$,

where X_d is the direct reactance and X_q is the quadrature reactance.

2. (Original) The machine as claimed in claim 1, characterized in that $X_d/X_q > 1.1$ and better still $X_d/X_q > 1.5$.

3. (Original) The machine as claimed in claim 2, characterized in that $X_d/X_q \simeq 3$.

4. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that X_qI_o/E is between 0.33 and 0.6.

5. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that X_dI_o/E is between 0.66 and 1.

6. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the stator (10) has teeth (11), each carrying at least one individual coil (12).

7. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 6, characterized in that the teeth (11) of the stator (10) are devoid of pole shoes.

8. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the rotor (20) is a flux-concentrating rotor, the permanent magnets (21) of the rotor being placed between pole pieces (22).

9. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 8, characterized in that the pole pieces (22) of the rotor each have a face turned toward the stator (10), which face has a convex portion (24).

10. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 9, characterized in that the convex portion (24) of a pole piece (22) has a radius of curvature of between 20% and 30% of the inside radius (R) of the stator.

11. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 10, characterized in that the circumferential ends (25) of the convex portion (24) of a pole piece (22) are angularly offset relative to the permanent magnets (21) adjacent this pole piece (22).

12. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 11, characterized in that the angular offset β of the circumferential ends (25) relative to the adjacent permanent magnets (21) lies:

- between $80°/n_{teeth}$ and $100°/n_{teeth}$, being especially about $90°/n_{teeth}$, for a machine in which the ratio of the number of stator teeth n_{teeth} to the number of rotor

poles n_{poles} is 3/2 or which satisfies the relationship $n_{teeth}/n_{poles} = 6n/(6n - 2)$, where n is an integer greater than or equal to 2; and

- between $50°/n_{teeth}$ and $70°/n_{teeth}$, being especially about $60°/n_{teeth}$, for a machine that satisfies the relationship $n_{teeth}/n_{poles} = 6n/(6n + 2)$, where n is an integer greater than or equal to 2.

13. (Currently Amended) The machine as claimed in ~~any one of claims 8 to 12~~claim 8, characterized in that each of the permanent magnets (21) of the rotor (20) lies radially set back from the circumferential ends of the convex portions (24) of the two adjacent pole pieces (22).

14. (Currently Amended) The machine as claimed in ~~the preceding claim~~claim 13, characterized in that the setback (r) in the radial direction of the magnets (21) relative to the circumferential ends (25) of the convex portions (24) lies between 10% and 20% of the inside radius (R) of the stator (10).

15. (Currently Amended) The machine as claimed in ~~any one of claims 8 to 14~~claim 8, characterized in that each of the pole pieces (22) of the rotor (20) has two shoulders (26), at least one permanent magnet (21) lying between the shoulders of two adjacent pole pieces (22).

16. (Currently Amended) The machine as claimed in ~~any one of claims 8 to 15~~claim 8, characterized in that each of the pole pieces (22) of the rotor (20) has a salient part (27) extending toward the stator (10), having radial edges (28) that are angularly offset

relative to the radially directed edges (29) of the permanent magnets (21) adjacent the pole piece (22).

17. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the permanent magnets (21) have, when the machine is observed along the axis (X) of rotation of the rotor, a cross section of elongate shape with its long axis lying in a radial direction.

18. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the permanent magnets (21) of the rotor (20) have, when the machine is observed along the axis (X) of rotation of the rotor, a rectangular cross section with its large side oriented parallel to a radius of the machine.

19. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the stator (10) has 6n teeth (11) and the rotor (20) has 6n ± 2 poles (22), n being greater than or equal to 2.

20. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that it has a single inner rotor.

21. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that the power of the machine is equal to or greater than 0.5 kW.

22. (Currently Amended) The machine as claimed in ~~any one of the preceding claims~~claim 1, characterized in that it constitutes a generator.

23. (Currently Amended) The machine as claimed in ~~any one of claims 1 to 21~~claim 1, characterized in that it constitutes a motor.

24. (Currently Amended) An assembly comprising:

- a machine as defined in ~~any one of claims 1 to 19~~claim 1, this machine constituting a synchronous motor; and

- a control device for controlling a synchronous motor, allowing the motor to operate at approximately constant power P_o over a range of rotation speeds of the rotor, which includes a computer (45) designed to determine the direct current component I_d and the quadrature current component I_q of the motor supply current, the current component I_d and I_q being equal, to within 20%, better still to within 10% and even better to within 5%, to:

$I_d \simeq i_d I_o \simeq -i\sin\alpha I_o$ and $I_q \simeq i_q I_o \simeq i\cos\alpha I_o$,

where I_o is the maximum intensity of the current imposed by the rating of the control device;

$$\alpha = \arctan\left(\frac{x_q(e-y)}{x_d\ x}\right);$$

$$i = \sqrt{\left(\frac{x}{x_q}\right)^2 + \left(\frac{e-y}{x_d}\right)^2}$$, the unitary current flowing in one phase of the armature;

(x,y) being one of the real roots of the equations:

$$x^2 + y^2 = \frac{v^2}{m^2} \text{ and } y = e\left(1 - \frac{x_d}{x_d - x_q}\right) + \frac{p}{m} e \frac{x_d x_q}{x_d - x_q} \frac{1}{x};$$

m denotes the ratio of the rotation speed of the rotor to the base speed;

e is the ratio of, on the one hand, the electromotive force and, on the other hand, the product of m multiplied by the voltage V_o imposed by the mains supply;

v is the ratio of the voltage across the terminals of one phase of the armature to the maximum voltage per phase V_o imposed by the mains supply;

p is the ratio of the rms power to the power P_o;

α is the phase difference between the current and the electromotive force;

x_d is the quotient $\frac{X_d I_o}{mV_o}$, X_d being the direct reactance; and

x_q is the quotient $\frac{X_q I_o}{mV_o}$, where X_q is the quadrature reactance.

25. (Currently Amended) The assembly as claimed in ~~the preceding claim~~claim 24, characterized in that the root (x,y) chosen is that which minimizes i.

26. (Currently Amended) The assembly as claimed in ~~either of the two preceding claims~~claim 24, characterized in that it includes:

- a three-phase inverter (35); and
- a vector controller (37) designed to transmit, according to the current components i_d and i_q, control signals to electronic switches (60) of the inverter (35).

27. (Original) A method of controlling a motor as defined in claim 23, in which:

- at least the supply voltage (V_{DC}) of an inverter connected to the motor and the rotation speed (Ω) of the motor are measured; and

- the direct current components i_d and the quadrature current components i_q of the supply current for maintaining constant power for a given speed setpoint (Ω^*) above the base speed are determined by real-time calculation and/or by access to a register on the basis of at least the voltage V_{DC} and the measured speed.

28. (Currently Amended) The method as claimed in ~~either of the two preceding claims~~claim 26, characterized in that a torque setpoint t* is determined as a function of at least the difference between the measured rotation speed (Ω) and the rotation speed setpoint (Ω^*) of the rotor.

29. (Currently Amended) The method as claimed in ~~the preceding claim~~claim 28, characterized in that a power setpoint (p*) is determined as a function of at least the torque setpoint and the measured rotation speed.

30. (Currently Amended) The method as claimed in ~~the preceding claim~~claim 29, characterized in that the direct current component i_d and quadrature current component i_q values are calculated in real time from the power setpoint, the measured rotation speed and the DC supply voltage of the inverter.